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# GROWING RUTABAGAS

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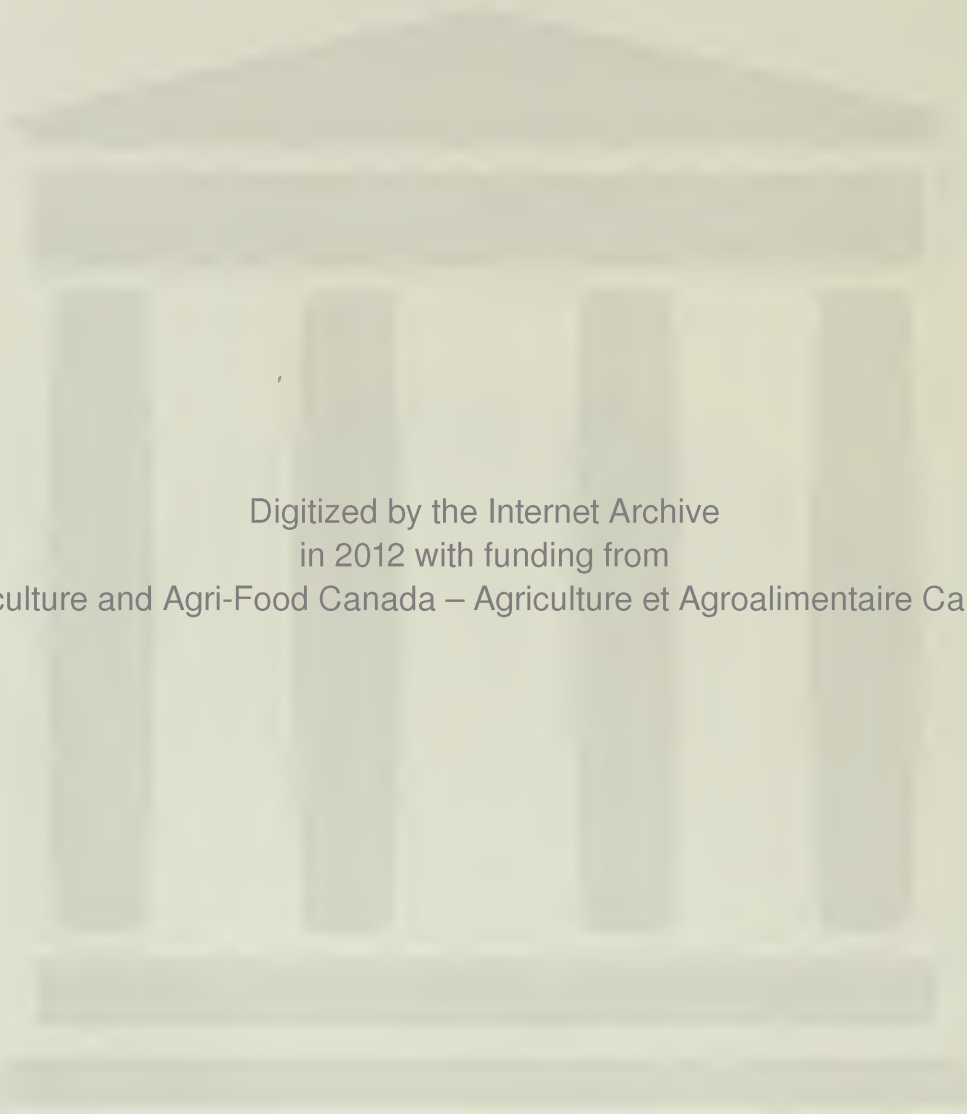
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# GROWING RUTABAGAS

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Rutabagas, commonly known as table turnips or swedes, are a valuable winter vegetable and can be grown profitably in many parts of Canada. Under favorable conditions a hectare of rutabagas yields 44–55 tonnes, but top yields of more than 77 t/ha have been obtained. The cost of production varies greatly, depending on labor costs, degree of mechanization, and general efficiency of the farming operation.

There is a steady demand for high-quality rutabagas on the domestic and foreign markets. However, anyone planning to grow rutabagas commercially must recognize that production of a top-quality product is not a simple undertaking. All phases of production, including preparation of soil, crop rotation, control of insects and diseases, harvesting, and storage, must be closely regulated. Failure to follow recommendations for each phase will result in partial or complete loss of a marketable crop.

## VARIETIES

The most commonly grown variety in Canada is Laurentian, a globe-type, purple-topped, yellow-fleshed rutabaga (Fig. 1). However, the new varieties York and Fortune are now preferred in many areas because they are resistant to most strains of clubroot. Other varieties include Golden Table, Victory, Neckless, Alta Sweet, and Ditmar.

## SELECTION OF FIELDS

Select your field for rutabagas at least a year in advance. Choose a grainfield or a new meadow in preference to all other fields. Plow as soon as possible after an early crop of grain or the first cut of hay has been harvested. Cultivate as often as necessary to destroy emerging weeds, in both fall and spring. Alternatively, spray the field in the fall with a nonpersistent plant-eradicating herbicide, and then plow and prepare the field for planting in the spring.

For the next year's rutabaga crop do not use land where potatoes have been grown, nor fields that have been manured or limed, because there is danger of rhizoctonia, scab, and poor fertility balance. Fields used for potatoes are also likely to be low in organic matter and to have poor moisture-holding capacity. The use of a grainfield or a new meadow ensures better soil texture and a moderate supply of organic material to aid moisture retention.



## FERTILIZATION

Take soil samples for testing the year before planting rutabagas to determine the rates of nitrogen, phosphorus, and potassium to be applied to obtain maximum yields.

Too much fertilizer can be detrimental to this crop. Rutabagas can utilize rather large amounts of phosphorus, but too much nitrogen or potassium can be harmful. High amounts of nitrogen in the soil usually result in growth cracks in rutabagas, which may render the crop unmarketable for table use. These breaks in the root may also allow entry of organisms that cause black rot and soft rot.

Rutabagas also need boron present in an available form in the soil. In many areas of Canada this element is deficient in the soil or unavailable to plants. Lack of sufficient boron results in brown heart (water core). To overcome this problem, borated fertilizers can be used in acid soil areas; in alkaline soils, sprays containing boron can be applied to leaves when roots are less than 2.5 cm in diameter. Consult your provincial department of agriculture for details on the best methods and rates of boron application for your area, and also for recommended rates of application for N, P, and K fertilizers.

## SEEDING

Always use graded, registered seed, which should be treated with a fungicide to prevent damping-off and other diseases.

For crops grown for winter storage, the best time to seed is mid June to early July. Crops seeded in April and May have a limited market. Also, if all the crop from an early planting is not harvested in July or early August, insect control becomes a problem.

Sow seed 1 cm deep for ground-level plantings and 2–2.5 cm deep for ridged-row plantings. To accommodate the equipment used for planting, cultivating, and harvesting, space the rows 75–90 cm apart, depending on the grower's preference.

For maximum yields, rutabaga plants should be spaced 10–12 cm apart. Precision seeders can be set to place the individual seeds 12 cm apart in each row and thus avoid the work of thinning. However, this practice may result in oversized and uneven development of roots because all seeds do not germinate, some seeds germinate more quickly than others, and some seedlings are weaker than others and do not develop at the same rate.

A common practice is to set the seeder to space the seeds about 6 cm apart. Excess plants and weak seedlings are then later removed using a hoe with a 5-cm cutting edge to ensure the optimum plant spacing.

**Note:** plants do not have to be precisely 10–12 cm apart; removal of a weak seedling to give a spacing of 10–15 or 5–10 cm between plants is better than removal of a strong seedling so that all plants are exactly 10 cm apart. Two strong plants tend to push each other sideways and develop equally, but a strong plant always crowds out a weak one. Producers are also strongly advised to seed rutabagas on firmly compacted, shallow, ridged rows rather than to plant them at ground level. On ridged rows the rutabagas develop on the surface rather than in the soil and produce a more attractive-looking root with a full purple crown, as shown in Fig. 1.

## CONTROLLING WEEDS

Weeds can severely reduce the yield of rutabagas. For maximum yields select fields that are relatively free from weed grasses such as quack grass, barnyard grass, and green foxtail. Most grasses and broad-leaved weeds can be controlled by plowing in early fall and disking at regular intervals until freeze-up and again in the spring before planting. After planting, cultivate to a depth of 5 cm only, especially after the rutabaga roots begin to enlarge.

For specific preplanting or postemergence herbicides recommended for control of weeds in rutabaga fields, consult the provincial weed specialist in your area for up-to-date recommendations, or obtain a copy of the current guide to chemical weed control or vegetable production from a provincial agricultural representative or from your nearest Agriculture Canada research station.

**Caution:** Rutabagas are sensitive to injury from herbicides that are safe for other crops. Never use a sprayer that has been previously used to apply 2,4-D, MCP, or other related products. Keep rutabagas away from fields where herbicides such as 2,4-D are to be used; sufficient chemical can drift onto the rutabagas to cause damage. Do not plant rutabagas in fields where residual herbicides were used the previous year, because enough herbicide may still be present in the soil to cause injury to this crop. However, certain materials such as 2,4-D and MCP can be used on adjacent crops if applied before rutabagas emerge.

## CONTROLLING INSECTS AND DISEASES

The most destructive pest of rutabagas is the cabbage maggot. This insect, which resembles a small house fly, lays its eggs in the soil near the young plants. The eggs hatch into small white maggots, which feed on the rutabaga roots and render them unmarketable (Fig. 2). For specific recommendations on the control of this pest in

your province or region, consult your provincial entomologist, nearest agricultural representative, or specialist at an Agriculture Canada research station. Guides for production and pest control are reviewed annually and revised when required by the province or region. In the Atlantic region a preferred method is to apply a single, preplanting, subsurface band of a granular insecticide in a shallow ridged row. The toxic elements of the insecticide become distributed throughout the surface soil and control the root maggots throughout the growing season, as long as there is enough soil moisture to maintain the insecticide in an active (toxic) form. With this method, the compound is more concentrated against the pests than against the predators and parasites on the soil surface or on foliage. Midseason spray or drench treatments are also recommended in all areas of Canada. To minimize the harmful effects of these treatments on beneficial insects, take care to concentrate the spray or drench over the crown and bulb of the plant.

Foliage-feeding insect pests of rutabagas and related plants include the imported cabbageworm, the cabbage looper, and larvae of the diamondback moth. Flea beetles make small holes in the leaves and also attack the roots. The purplebacked cabbageworm destroys foliage and also eats holes in the sides of roots (Fig. 3), causing damage that resembles that produced by slugs. To control both root maggots and foliage pests, contact your provincial entomologist or nearest agricultural representative for detailed information.

The most serious disease attacking rutabagas is clubroot (Fig. 4). To avoid infection, do not grow rutabagas in a field that was used during the previous 5 years for rutabagas, cabbages, or related plants. The new varieties York and Fortune are resistant to most strains of clubroot that may be present in the soil. However, the disease may develop gradually and destroy even these varieties if they are grown year after year in the same field.

Other diseases affecting rutabagas include black rot, neck rot, rhizoctonia (Fig. 5), scab (Fig. 6), and black leg. Seed treated with a fungicide gives protection against some diseases. However, the best way to avoid serious problems is to follow good farming practices.

**Caution:** A machine developed at the research station in Charlottetown bands the fertilizer in the row, applies precise amounts of insecticide at a specified depth below the soil surface, and applies and spaces the seed. These machines save a great deal of labor, and models or prototypes have been in use for several years. If you use such a machine, make sure it is properly adjusted by a trained operator so that it applies the fertilizer, insecticide, and seed at the proper depths. Otherwise, the fertilizer or insecticide can kill the emerging seedlings.



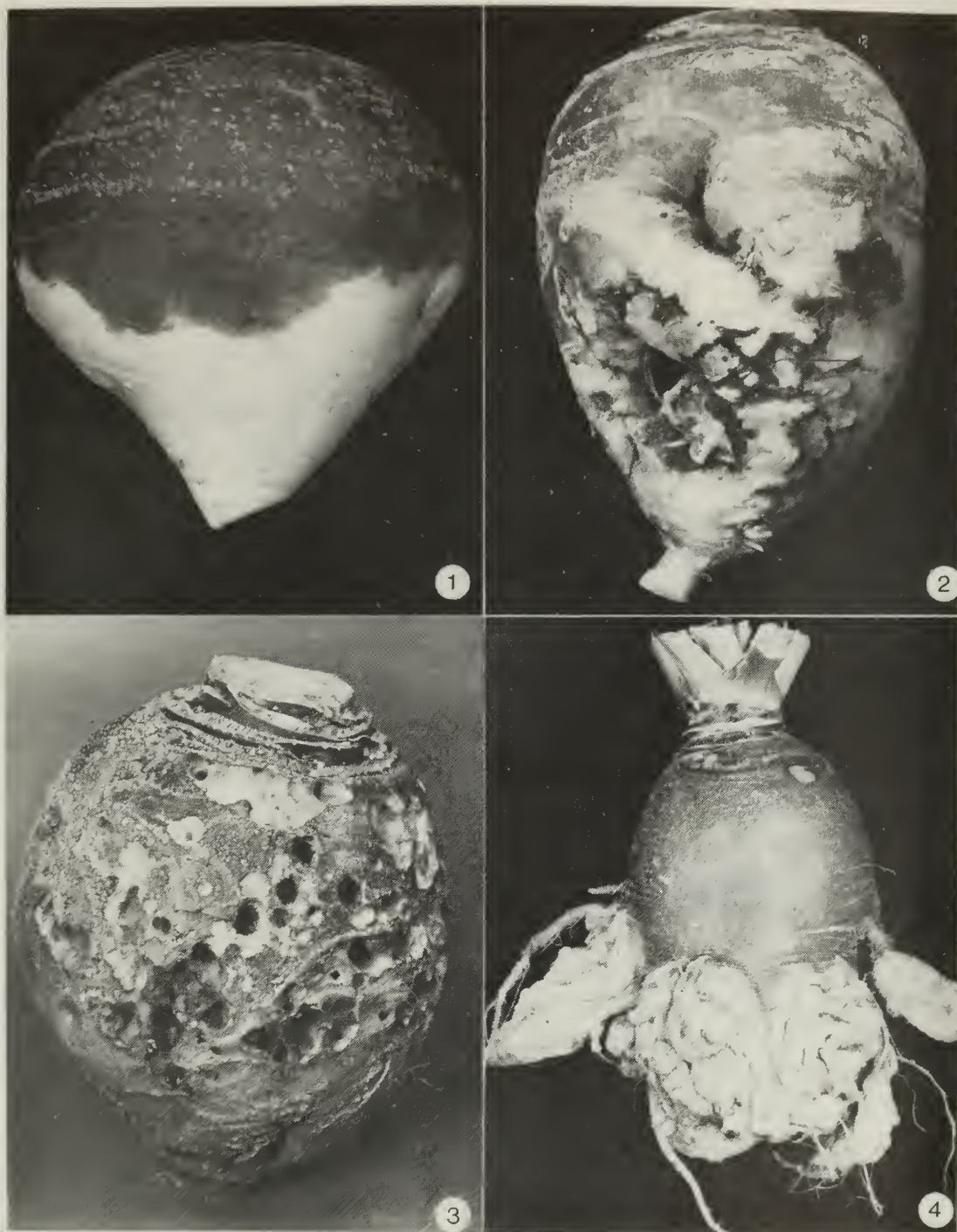


Figure 1. The globe-shaped, purple-topped varieties Laurentian or York are the most desirable for marketing.

Figure 2. Root maggot injury. The large scars are caused by early infestations, and the darker tunnels by larval feeding late in the season.

Figure 3. Severe damage caused by larvae of the purplebacked cabbageworm feeding on the side of a rutabaga.

Figure 4. Clubroot on main bulb and on side roots of a rutabaga.

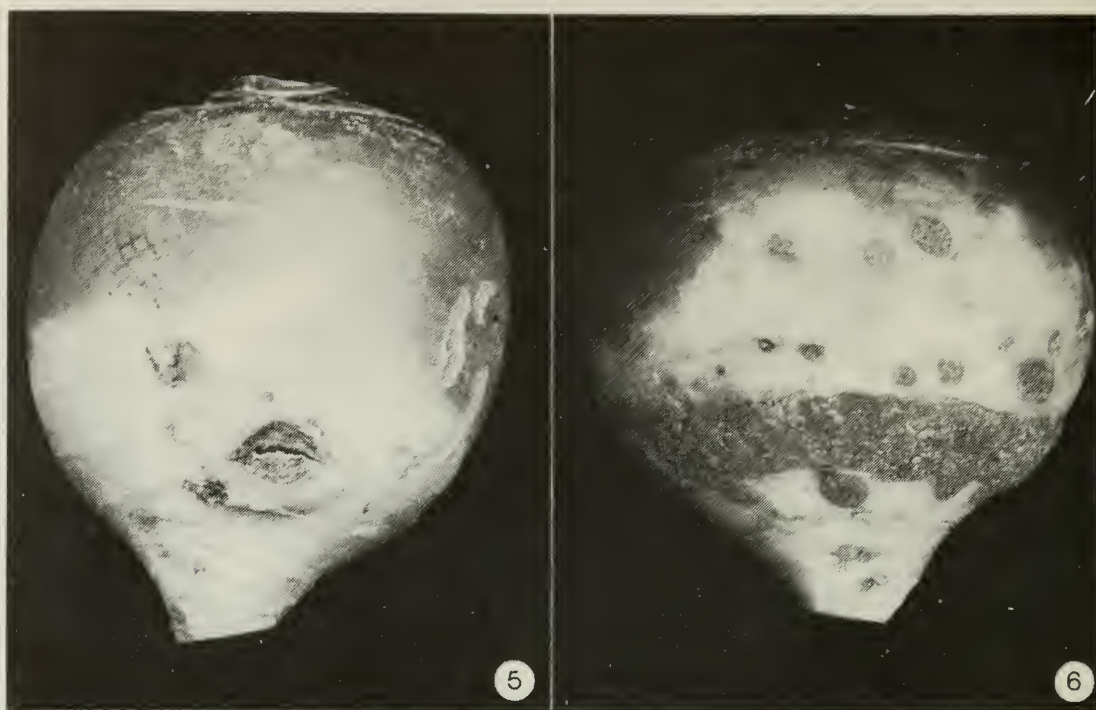


Figure 5. *Rhizoctonia* lesions are found mainly on the root surface close to ground level. Under poor storage conditions, lesions develop and cause severe internal rot.

Figure 6. Common scab on rutabaga. This disease is most severe in land where potatoes were grown the previous year and during a dry season.

## HARVESTING

The quality and flavor of rutabagas are much improved when the roots are fully matured or are exposed to a slight frost before harvesting. Immature roots have a bitter taste, and if early seeded rutabagas are left in the field until late fall the roots tend to become fibrous and woody.

Certain types of potato diggers can be adapted for harvesting rutabagas. The tops are removed with a topping device before the rutabagas are harvested. With modifications, machines used for harvesting sugar beets or carrots can also be used for harvesting rutabagas. In preparation for long-term winter storage (6–8 months), trim the tops to within 1 cm of the body and cut off the bottom of the taproot and the fibrous side roots. Protect newly harvested rutabagas from sunburn and freezing at all times. Handle rutabagas gently to avoid bruising. Consult an agricultural engineer about installing leather belting on the sides of elevators and on chains to minimize bruising when using potato or sugar beet harvesting equipment for rutabagas.



## STORAGE

Rutabagas may be piled up to 2 m deep over a slatted floor equipped with an air circulation system to keep the temperature uniform. Perforated plastic sheeting placed horizontally at 45-cm intervals helps to reduce moisture loss and excessive accumulation of moisture at the top of the pile or on the roof of the storage area.

Maintain the storage temperature close to 0°C and keep the humidity at 90% or higher. Under these conditions, rutabagas keep for 6–8 months.

**Important:** Bacterial and fungal organisms are always present in rutabaga fields and can be carried into storage areas in the moisture or in the wet soil clinging to the rutabagas. Drying the cut surfaces at the crown and roots, either in the open air before storing the crop or in the storage area by means of a forced-air ventilation system, destroys many of these organisms. Mechanical harvesters tend to spread such organisms, and if crops are not dried within a week or two after harvesting, storage rot can become severe. From 25 to 75% of a crop may be lost within 2–4 months, chiefly from rot caused by organisms entering at the crown or through mechanical wounds on the sides of the rutabagas. A recommended method for minimizing rot in the crown is to top the rutabagas a week or 10 days before harvesting.

For further information on the storage of rutabagas write to Communications Branch, Agriculture Canada, Ottawa, K1A 0C7, for Publication 1532, *Commercial Storage of Fruits and Vegetables*. To prevent sprouting while in storage and to prolong storage life, spray rutabagas with a sprouting retardant. Consult your agricultural representative for specific recommendations.

Do not store rutabagas with potatoes because the two vegetables require different storage conditions.

## WASHING AND WAXING

Wash and trim rutabagas just before shipping. Large lots can be washed and dried by special machines.

To obtain highest prices, rutabagas must be well trimmed and free from maggot injury, bruises, and other defects. The most popular size is 10–15 cm in diameter.

In some provinces rutabagas are waxed to prevent shriveling while on the display shelf. Waxing is considered to enhance the eye appeal of rutabagas and to increase consumer demand for them. Waxing, however, can cause problems. Even during storage, rutabagas are living plant material and they must be able to breathe.

Therefore, temperatures must be kept low after waxing. Waxed rutabagas spoil quickly at room temperature.

An alternative method for prolonging the shelf life of rutabagas is to place the roots in individual, perforated plastic bags. Rutabagas packaged this way have been kept at room temperature for 6 weeks without apparent deterioration, compared with 3 or 4 days for waxed ones under the same conditions.

## CULLING

Destroy all roots that have signs of disease or rot. Cull any that are misshapen, gouged, bruised, or punctured, as well as those having cracks or maggot injury; these can be sold as feed for livestock.

**Caution:** If culls are fed to livestock, never spread the manure on land that is to be used for growing rutabagas, because there is always a danger of undetected traces of clubroot being spread to future crops.



## CONVERSION FACTORS

Metric units	Approximate conversion factors	Results in:
<b>LINEAR</b>		
millimetre (mm)	x 0.04	inch
centimetre (cm)	x 0.39	inch
metre (m)	x 3.28	feet
kilometre (km)	x 0.62	mile
<b>AREA</b>		
square centimetre (cm <sup>2</sup> )	x 0.15	square inch
square metre (m <sup>2</sup> )	x 1.2	square yard
square kilometre (km <sup>2</sup> )	x 0.39	square mile
hectare (ha)	x 2.5	acres
<b>VOLUME</b>		
cubic centimetre (cm <sup>3</sup> )	x 0.06	cubic inch
cubic metre (m <sup>3</sup> )	x 35.31	cubic feet
	x 1.31	cubic yard
<b>CAPACITY</b>		
litre (L)	x 0.035	cubic feet
hectolitre (hL)	x 22	gallons
	x 2.5	bushels
<b>WEIGHT</b>		
gram (g)	x 0.04	oz avdp
kilogram (kg)	x 2.2	lb avdp
tonne (t)	x 1.1	short ton
<b>AGRICULTURAL</b>		
litres per hectare (L/ha)	x 0.089	gallons per acre
	x 0.357	quarts per acre
	x 0.71	pints per acre
millilitres per hectare (mL/ha)	x 0.014	fl. oz per acre
tonnes per hectare (t/ha)	x 0.45	tons per acre
kilograms per hectare (kg/ha)	x 0.89	lb per acre
grams per hectare (g/ha)	x 0.014	oz avdp per acre
plants per hectare (plants/ha)	x 0.405	plants per acre



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